

Tip #12 Biscuit Joiner

Most woodworking projects require at least some assembly. This is especially true for projects such as tables, cabinets or book-cases where wide panels must first be built up from several narrow boards.

Traditionally, woodworkers have used dowels for these assemblies. As you might expect, dowels add strength to certain types of joints, but they serve an equally important function by keeping the pieces properly aligned during assembly and gluing. The major drawback with doweling, however, is that each hole must be perfectly positioned or the individual pieces simply won't go together. Even a slight error can cause a lot of pounding and frustration.

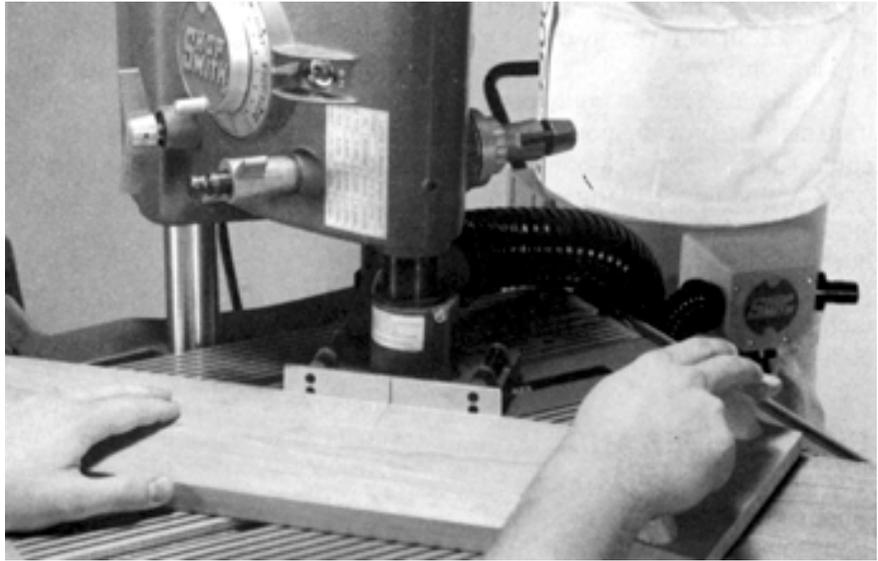


Figure 23-1. The biscuit joiner is powered by the Mark V's powerplant and can be used with either the Model 500 or Model 510.

During the 1950's a new assembly system called biscuit joinery was developed in Europe. This system uses flat wooden wafers or biscuits which are glued into semi-elliptical slots on each side of the joint. Due to the shape of the biscuits, the exact location of the slot is much less critical than a dowel hole. Minor adjustments can even be made during assembly, so projects go together much more quickly and yet there is no sacrifice in strength or overall performance. That's why biscuit joinery is rapidly becoming the preferred assembly system for professional furniture and cabinet makers worldwide.

In addition to its advantages for panel assembly, biscuit joinery can often be used to replace more complicated and time consuming techniques including spline, tongue-and-groove, mortise-and-tenon and dado joints.

BISCUIT JOINER- SETUP AND FEATURES

The biscuit joiner housing attaches to the quill and the blade arbor attaches to the main power spindle of the Mark V's powerplant (Figure 23-1). It may be used with either the Mark V Model 500 or Model 510. Follow the setup instructions in the Owners Manual that came with your biscuit joiner. Some of the important features (Figure 23-2) and capacities of your biscuit joiner are:

- Spring-loaded workpiece guide and safety guard help improve operator confidence and safety.
- Engraved centerline on guide permits easy alignment of workpiece.
- Adjustable depth stops and guide rod grooves permit easy use of three different biscuit sizes (#0, #10 and #20) for a variety of applications.
- Adjustable pins in guide penetrate stock to provide more positive control and reduce kickbacks.
- Carbide-tipped blade will provide years of normal service without sharpening.

- Built-in dust chute for easy attachment of standard 2-1/2" dust collection hoses.

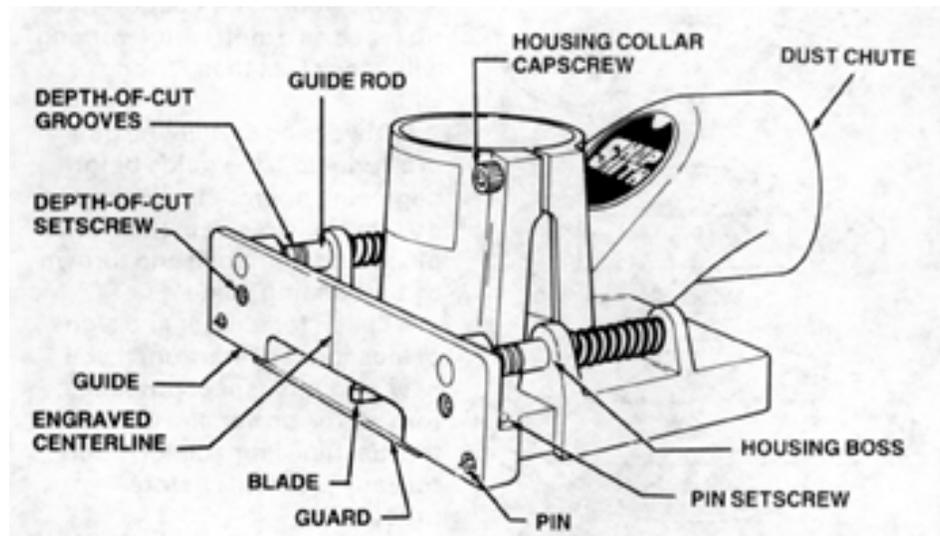


Figure 23-2. Familiarize yourself with these important features of the Shopsmith biscuit joiner.

BISCUIT SIZES AND CONSTRUCTION

Shopsmith biscuits are produced from select grades of beech. For maximum strength, the grain is oriented at a 45° angle to the long axis of the biscuit. During production, biscuits are exposed to many tons of pressure which compresses the fibers and produces a waffle-like surface for better glue absorption and adhesion.

When glue is applied to the biscuits, the moisture in the glue causes the biscuits to expand by about 15% of their original thickness and the joint becomes tight. Since this expansion occurs very quickly, glue should never be applied to the biscuits until you are ready for final assembly. Biscuits should also be protected against water or extremely high humidity. A coffee can with a tight fitting lid makes a good storage container.

Biscuits are available in three different sizes to meet a variety of applications (Figure 23-3). All biscuits are 5/32" thick.

#0 biscuits are 1-3/4" x 5/8". They are best for joining smaller workpieces and for edge-to-edge assemblies where high stress is not anticipated. They are also useful for joining narrow pieces such as cabinet frames end-to-edge.

#10 biscuits are 2-1/8" x 3/4". They are recommended for general purpose joinery on all types of projects.

#20 biscuits are 2-3/8" x 1". They are recommended for use on larger projects or joints—such as a table skirt and leg—which will be subject to high stress or twisting forces. They also provide greater penetration and a larger gluing surface, so they are well suited for plywood or particle board applications.

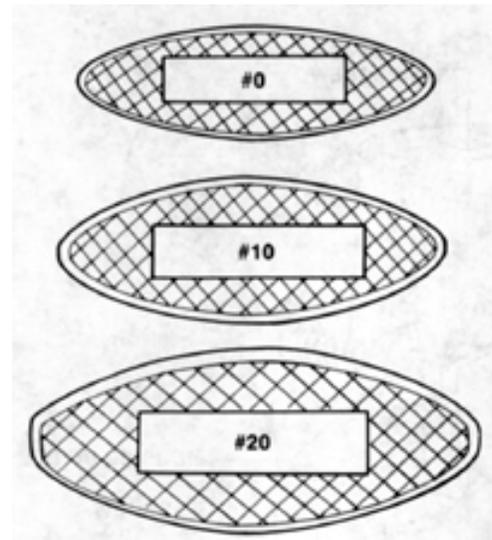


Figure 23-3. The three available biscuits are shown here.

BISCUIT JOINER SAFETY

Read, understand and follow all safety and operating instructions in the Owners Manuals that came with the Biscuit Joiner and with the MARK V on which it is mounted.

- **Wear safety goggles, safety glasses with side shields or a full face shield.**
- **Tuck long hair under a hat or tie it up. Do not wear ties, gloves, jewelry or loose clothing. Roll sleeves up above your elbows. Wear nonslip footwear.**
- **Before mounting the biscuit joiner on the Shopsmith MARK V, turn on the MARK V and set the speed dial to SLOW. Then turn off and unplug the machine before proceeding.**
- **When mounting the biscuit joiner on the MARK V, be certain all locking screws are tightened securely before turning on the machine.**
- **Be sure the blade is mounted in the biscuit joiner with the teeth pointing in the direction of the arrows on top the housing. Installing the blade backwards will result in kickbacks and injury.**
- **Connect a dust collection system to the biscuit joiner dust chute or wear a dust mask.**
- **Do not allow anyone to stand directly in front of the opening of the dust chute.**
- **Move the workpiece slowly into the blade—never force it. Feeding stock too rapidly could cause kickbacks.**
- **Do not stand directly in-line with the workpiece being fed. In the event of a kickback, you will be hit.**
- **Do not rest fingers in the miter gauge slots where they could be trapped and pinched by kicked back stock.**
- **Always use the push block in your right hand to feed stock into the blade. This is especially important when working with small stock.**
- **Use your miter gauge and/or rip fence as a stop when working with stock less than 6" long or wide.**
- **Always be certain the pins protrude from the guide before beginning operations. Failure to do this could result in the workpiece being grabbed and thrown by the rotating blade.**
- **Listen for chatter and signs of looseness at startup. If you hear, see or suspect problems, turn off the power and unplug the machine immediately. Correct any problems before proceeding.**
- **Never use the biscuit joiner for jobs it is not intended to perform such as sawing, grooving, etc.**
- **Never exceed speed setting "T" on the MARK V's speed dial for biscuit joiner operations.**
- **Never attempt to use the biscuit joiner on stock less than 3/8" thick.**
- **Never operate the biscuit joiner without the housing and guard in position.**
- **Always keep the blade clean and sharp.**
- **Use only Shopsmith blades and parts for your biscuit joiner. Using non-Shopsmith blades or parts will create a hazardous condition and will void your warranty.**

BASIC BISCUIT JOINERY TECHNIQUES

Marking Joints- The only marking normally required for biscuit joinery is to indicate the centerline for each biscuit's location. These markings are usually made on the back side of the stock and may be made with a square (Figure 23-4) or freehand. Marked centerlines are then aligned with the engraved centerline on the biscuit joiner guide while quill and worktable adjustments are then used to control the biscuit's vertical position. Figure 23-5 shows typical markings for various types of joints.

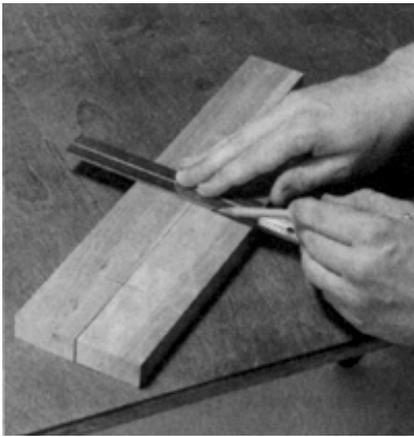


Figure 23-4. Mark centerlines on both pieces of stock to assure proper alignment.

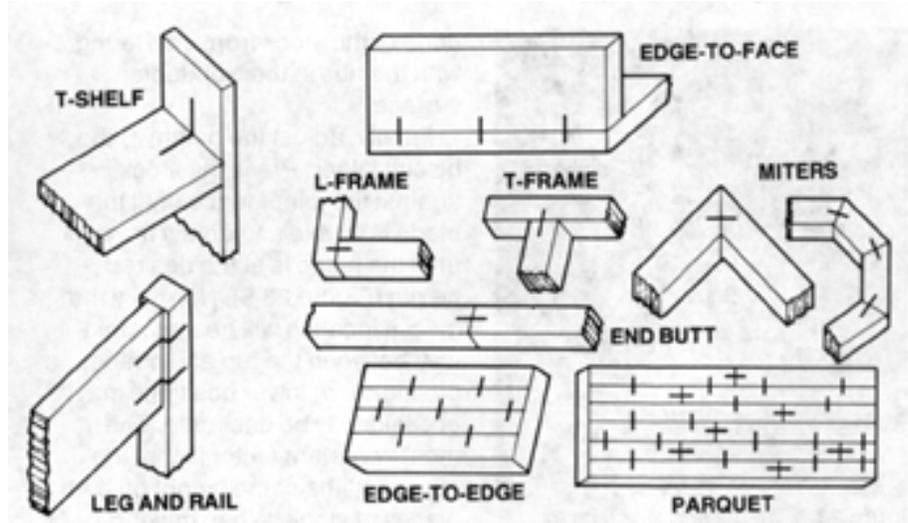


Figure 23-5. Here you see typical centerline markings for various types of joints.

Basic Adjustments and Cuts-

After mounting the biscuit joiner on the Mark V (Figure 23-6) and establishing a basic setup as shown in the biscuit joiner Owners Manual, several adjustments must be made before using the accessory. These basic procedures apply to all types of joints, so review these steps before each biscuit joiner operation.

Begin by selecting the size biscuit you will be using and set the depth-of-cut accordingly. This is done by unplugging the Mark V and compressing the spring-loaded guide until the desired grooves on the guide rods are even with the biscuit joiner housing. The three grooves in the guide rods indicate the correct settings for #0, #10 and #20 biscuits respectively. Adjust both depth stop setscrews (Figure 23-7), so that the guide cannot retract beyond the desired depth.

Next adjust the two pins in the guide face and lock them firmly in place (Figure 23-8). These pins provide important kickback protection and should penetrate about 1/32" in hard woods and 1/16" into softer woods.

When using the Mark V Model 510, position the worktable so the face of the biscuit joiner guide is above the table insert (Figure 23-6). This will keep the leading edge of the stock from interfering with the ribs in the worktable surface.

Finally, adjust the height of the biscuit joiner. Press the stock against the joiner fence until the blade is visible and adjust the quill until the blade is at the desired height (Figure 23-9). Normally the biscuit location will be about midway between the top and bottom, but higher or lower positions may occasionally be desirable. The most important factor is that the cuts be at the same height on both pieces of stock. When making these adjustments, the quill should not be extended more

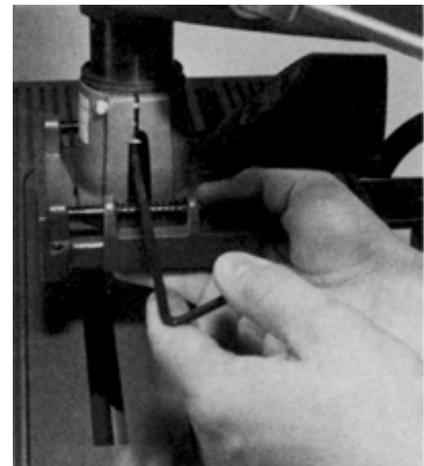


Figure 23-6. Attach the biscuit joiner to the quill and tighten the housing collar capscrew. Don't forget to tighten the setscrew which holds the blade arbor to the spindle.

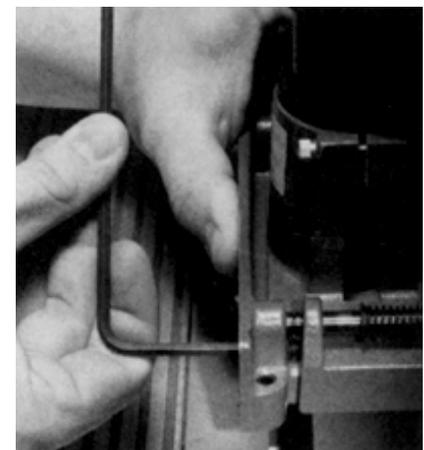


Figure 23-7. Adjust the depth-of-cut setscrews to match the biscuit size being used.